

REMARKS

Claims 1, 4, 6-10, 12, 13, 15-19, and 21-27 are pending.

Claims 2, 3, 5, 11, 14, and 20 have been cancelled.

Claims 28-35 have been added.

In the Office Action dated November 13, 2009, the specification was objected to; claims 1-7 were rejected on the grounds of non-statutory double patenting over claims 1, 3, and 4 of U.S. Patent No. 7,146,353 in view of Hill (U.S. Patent Publication No. 2004/0267897); claim 9 was rejected on the grounds of non-statutory double patenting over claim 10 of U.S. Patent No. 7,146,353 in view of Hill (U.S. Patent Publication No. 2004/0267897); claims 10 and 16 were rejected on the grounds of non-statutory double patenting over claims 13 and 16 of U.S. Patent No. 7,146,353 in view of Hill (U.S. Patent Publication No. 2004/0267897); claims 18 and 22 were rejected on the grounds of non-statutory double patenting over claims 1, 3, and 4 of U.S. Patent No. 7,146,353 in view of Hill (U.S. Patent Publication No. 2004/0267897); claims 1, 4, 9-13, and 18-19 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hill in view of Lee ("Routing Subject to Quality of Service Constraints in Integrated Communication Networks"); claims 5-6, 14-15, and 20-21 was rejected under 35 U.S.C. § 103(a) as unpatentable over Hill in view of Lee and further in view of Varanski (U.S. Patent No. 7,443, 799); claims 7-8, 16-17, and 22-23 was rejected under 35 U.S.C. § 103(a) as unpatentable over Hill in view of Lee and further in view of Das (U.S. Patent Publication No. 2005/0172291); claims 24-27 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hill in view of Lee and further in view of Husain (U.S. Patent Publication No. 2003/0126260); and claims 1, 4, 9-10 and 18 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hill in view of Zhu (U.S. Patent Publication No. 2003/0120780).

OBJECTION TO TITLE

The Title has been amended to address the objection to the title. Therefore, withdrawal of the objection is respectfully requested.

OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION

In view of the amendments made to the present claims, it is respectfully submitted that the non-statutory obviousness-type double patenting objection has been rendered moot. Specifically, the listed claims of the '353 patent made in the Office Action, in combination with Hill, do not disclose or hint at the following subject matter of the claims: determining the assigned subset of available resources for each application based on a linearized objective function that reduces communication delays between the resources of the subset of the available resources in conformance with bandwidth capacity requirements of the application and in conformance with network bandwidth limitations, where the linearized objective function includes a linear combination of variables.

In view of the foregoing, it is respectfully requested that the obviousness-type double patenting rejection be withdrawn.

REJECTION UNDER 35 U.S.C. § 103 OVER HILL IN VIEW OF LEE

Claim 1 has been amended to recite the following:

determining, by the computer, an assigned subset of the available resources for each application as a function of the required resources of the application and the available resources, wherein determining the assigned subset of available resources for each application is based on a linearized objective function that reduces communication delays between resources of the subset of the available resources in conformance with bandwidth capacity requirements of the application and in conformance with network bandwidth limitations, wherein the linearized objective function includes a linear combination of variables.

Support for the amendments of claim 1 can be found at least in the following passages of the present application: ¶¶ [0048], [0049], [0052], [0079]-[0081], [0087], [0108]. Similar support exists for the amendments of independent claims 9, 10, and 18.

It is respectfully submitted that claim 1 is non-obvious over Hill and Lee.

To make a determination under 35 U.S.C. § 103, several basic factual inquiries must be performed, including determining the scope and content of the prior art, and ascertaining the differences between the prior art and the claims at issue. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459 (1965). Moreover, as held by the U.S.

Supreme Court, it is important to identify a reason that would have prompted a person of ordinary skill in the art to combine reference teachings in the manner that the claimed invention does. *KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007).

Hill describes a method for regulating resource usage by a plurality of programs running on a plurality of machines, where the method includes providing a resource policy specifying allocation of resources among the programs, and allocating resources to each program based upon the resource policy and resource information exchanged among the machines. Hill, Abstract.

However, nowhere does Hill provide any teaching or hint of determining the assigned subset of available resources for each application based on a linearized objective function that reduces communication delays between resources of the subset of the available resources in conformance with bandwidth capacity requirements of the application and in conformance with network bandwidth limitations, where the linearized objective function includes the linear combination of variables.

Lee describes formulating path selection as a shortest path optimization problem, by determining a series of network links connecting the source and destination such that a particular objective function is minimized. Lee, p. 46, col. 1. The solution proposed by Lee is designed to accommodate traffic with diverse QoS (Quality of Service) requirements, by using a call-by-call source routing strategy that makes use of rule-based fallbacks. *Id.*, p. 54, col. 2, Conclusion. The fallback routing of Lee is an iterative path calculation approach in which routing constraints can be modified in each iteration based on QoS requirements of the call, the connection state of the call, and the dynamic network information. *Id.* The outcome of the fallback path calculation is either a selected path or that there is no path that satisfies all QoS constraints. *Id.*

Path selection in the routing context of Lee is completely unrelated to determining an assigned subset of available resources (that include processing resources, networking resources, and storage resources) for each application based on a linearized function that reduces communication delays between resources of the subset, where the linearized objective function includes a linear combination of variables.

Since the hypothetical combination of Hill and Lee does not disclose each and every element of the subject matter of claim 1, it is respectfully submitted that claim 1 is non-obvious for at least this reason. Moreover, it is respectfully submitted that a person of ordinary skill in the art would not have incorporated a routing optimization problem that is based on QoS constraints, as taught by Lee, into the resource allocation system described in Hill.

In view of the foregoing, it is respectfully submitted that claim 1 is non-obvious over Hill and Lee.

Independent claims 9, 10, and 18 are similarly allowable over Hill and Lee.

REJECTION UNDER 35 U.S.C. § 103 OVER HILL AND ZHU

It is respectfully submitted that each independent claim is also non-obvious over Hill and Zhu. As noted above, Hill fails to disclose or hint at determining the assigned subset of available resources for each application based on a linearized objective function, as recited in claim 1. Zhu, on the other hand, actually describes optimized assignments as involving “solving hard combinatorial problems with constrained **non-linear** integer programming.” Zhu, ¶ [0028]. In a different embodiment described in Zhu, a reformulated and simplified problem is provided for performing constrained non-linear programming. *Id.*, ¶ [0039]. Reduction of complexity of the algorithm is described in ¶ [0040] et seq. of Zhu.

Zhu would have taught a person of ordinary skill in the art to use **non-linear** programming, as opposed to using a **linearized** objective function as recited in each of the independent claims.

A person of ordinary skill in the art would therefore not have been prompted to combine the teachings of Zhu and Hill to achieve the claimed subject matter.

Claim 1 and each of the other independent claims are therefore non-obvious over Hill and Zhu.

CONCLUSION

Dependent claims, including newly added dependent claims 28-35, are allowable for at least the same reasons as corresponding independent claims. In view of the

allowability of base claims, the obviousness rejections of dependent claims have been overcome.

SUMMARY OF TELEPHONIC INTERVIEW

On or around November 3, 2009, the Examiner called the undersigned to propose an amendment to place the claims in condition for allowance. The Examiner proposed that the subject matter of claims 6 and 8 be incorporated into all independent claims to place the claims in condition for allowance. No agreement was reached as a result of the interview. No references or exhibits were discussed.

It is noted that dependent claim 8 depends from claim 7, which depends from claim 6, which in turn depends from claim 1. Therefore, consistent with the proposal made by the Examiner, it is believed that claim 8 is in condition for allowance. Similarly, it is respectfully submitted that dependent claims 17 and 23 also contain allowable subject matter.

In view of the foregoing, allowance of all claims is respectfully requested.

The Commissioner is authorized to charge any additional fees and/or credit any overpayment to Deposit Account No. 08-2025 (200313904-1).

Respectfully submitted,

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/Dan C. Hu/

Dan C. Hu
Registration No. 40,025
TROP, PRUNER & HU, P.C.
1616 South Voss Road, Suite 750
Houston, TX 77057-2631
Telephone: (713) 468-8880
Facsimile: (713) 468-8883